Uniqueness of positive radial solutions for a class of infinite semipositone p-Laplacian problems in a ball

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Abstract

We prove uniqueness of positive radial solutions to the p-Laplacian problem

$$\begin{cases} -\Delta_p u = \lambda f(u) \text{ in } \Omega, \\ u = 0 \text{ on } \partial\Omega, \end{cases}$$

where $\Delta_p u = div(|\nabla u|^{p-2}\nabla u),\ p \geq 2,\ \Omega$ is the open unit ball in $R^N, N > 1,\ f : (0,\infty) \to \mathbb{R}$ is concave, $p-$ sublinear at ∞ with infinite semipositone structure at 0, and λ is a large parameter.

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